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MONITOR INTEGRATED INTO THE DRIVER'S
SEAT, FOR REAR PASSENGERS

The invention relates to a monitor for a motor vehicle having a fastening device and a power and signal supply, the monitor being arranged in a form-fitting fashion on a backrest of a vehicle seat by means of the fastening device, and the vehicle
5 seat having a head restraint with an extendable holder.

A fastening console for a mobile display screen that is used for rapid and secure mounting in the rear of the automobile is already known from DE 199 43 696 A1. The fastening console is
10 clamped together by hand around at least one head restraint holder of a vehicle by means of two limbs that are produced from metal or hard plastic and are joined together by a pin, and by means of a clamping bolt and a hand lever connected to it. The structure thus formed constitutes a support for
15 fastening the display screen stably.

It is the object of the invention to design and arrange a vehicle seat with a monitor in such a way that the monitor is reliably and permanently associated with the head restraint
20 while at the same time avoiding conflicting goals in front and in back as regards the position of the head restraint.

This object is achieved according to the invention by virtue of the fact that a housing part of the monitor is connected
25 directly via the fastening device to a frame part of the backrest of the vehicle seat, and the monitor being mounted in a direction of a horizontally running z-axis directly behind the head restraint on the backrest of the vehicle seat.

30 This results in a very stable and secure connection between the monitor and the vehicle seat. A rear passenger would

impact against the backrest in the event of a rear-end crash. A collision between the rear passenger and the monitor is therefore ruled out. In the event of such an accident, the monitor itself is additionally secured by the head restraint.

5 Moreover, unpleasant vibrations and shaking are prevented by the fact that the monitor bears against the head restraint.

The head restraint can be used to the full by the front passenger, that is to say can also be adjusted for height, without the rear passengers being adversely affected. The position of the monitor is retained upon adjustment of the head restraint, and conflicting goals are avoided. It is assured in this case in a way essential to the invention that no disturbing gap occurs between the head restraint and the backrest as a result of which the rear passenger would be dazzled by oncoming vehicles when watching the monitor.

It is advantageous for this purpose that a rear side, facing the monitor, of the head restraint runs parallel to the rear housing side of the monitor. It is also taken into account in this case that the rear side of the head restraint is not of flat, but of cambered design. The monitor and the head restraint thereby form a unit optically and in terms of safety.

25 An additional possibility in accordance with a development is that the rear side, facing the monitor, of the head restraint bears against the rear housing side of the monitor. The monitor is adapted to the head restraint and is stabilized by the head restraint because it bears against the latter. In the case of a rear-end crash, no additional impulse is transmitted from the head restraint onto the monitor, and the monitor is additionally secured by the head restraint.

It is, furthermore, advantageous that a sliding layer is introduced between the rear side of the head restraint and the rear housing side of the monitor, and the head restraint can be extended in the direction of an x-axis arranged

5 perpendicularly to the z-axis. The freedom of movement of the head restraint when being retracted and extended is restricted by the fact that the monitor bears against the head restraint. The sliding layer again ensures the freedom of movement required for retracting and extending the head restraint.

10 It is also advantageous for this purpose that the frame part of the backrest has at least one bearing or a bearing arrangement for the holder of the head restraint and at least one bearing or a bearing arrangement for the fastening device
15 of the monitor. It ensures that the head restraint is mechanically decoupled from the monitor. The holders known for head restraints are applied for fastening the monitor.

In accordance with a preferred embodiment of the solution
20 according to the invention it is provided, finally, that the housing of the monitor has cutouts and/or bores for the holder of the head restraint. In this embodiment, the head restraint is not cushioned on its rear side, and so the holders are not covered. The monitor covers the holders in the direction of
25 the rear passenger. The housing of the monitor has the cutouts required for this purpose.

It is particularly important for the present invention that an adapter is introduced between the monitor and the backrest,
30 the adapter being connected to the frame part of the backrest via the fastening device. The adapter is mounted on the backrest and fastened securely on the frame part of the backrest. The energy and signal supply is run underneath the adapter. The mounting of the monitor covers the fastenings
35 for the adapter and the electrical connections for optical

and, above all, for safety reasons. It is easy to exchange the monitor.

It is advantageous in conjunction with the inventive design
5 and arrangement that the energy and signal supply of the monitor runs downward in the backrest. Introduced inside the backrest in the region of the monitor's fastening device is a cable channel that is guided into the middle console in conjunction with further cables introduced into the vehicle
10 seat. Cabling that is disturbing optically and in terms of safety and runs outside the vehicle seat is thereby avoided.

It is advantageous, furthermore, that the monitor can be swiveled about a y-axis arranged perpendicular to the z-axis
15 and to the x-axis. This results in the possibility of setting the viewing angle of the rear passenger in relation to the monitor with reference to his/her body size and seated position.

20 The solution according to the invention offers the above-described advantages in terms both of safety and operation as regards a monitor arranged in the head restraint or in the backrest.

25 Further advantages and details of the invention are explained in the patent claims and in the description, and are illustrated in the figures, in which:

figure 1 shows a sectional view in an xz-plane between the
30 holders of the head restraint; and

figure 2 shows a perspective view of a monitor according to the invention.

The vehicle seat 3 partially illustrated in figure 1 has a backrest 3.1 with a frame. A frame part 3.2, illustrated in the upper region of the backrest 3.1, of the frame serves the purpose of fastening the head restraint 4.

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The head restraint 4 is mounted in the frame part 3.2 via two holders 4.1, each in a bearing 3.3, and can be adjusted in height relative to the vehicle seat 3 in the direction of the x-axis. The bearing 3.3 is designed as a plain bearing.

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Provided behind the head restraint 4 in the direction of the z-axis is a monitor 1 that is mounted on the backrest 3.1 via an adapter 1.4 and is fastened on the frame part 3.2 of the vehicle seat 3. The rear side 4.2 of the head restraint 4 runs parallel to the rear housing side 1.2 of the monitor 1. The monitor 1 bears against the head restraint 4 and is stabilized by the head restraint 4.

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The housing 1.3 of the monitor 1 has a housing part 1.1 that is mounted on the adapter 1.4. The adapter 1.4 is connected in a form-fitting fashion to the frame part 3.2 via a fastening device 2. For this purpose, the frame part 3.2 has a bearing 3.4 into which the fastening device 2 is introduced.

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By mounting the monitor 1, the contacts to the energy and signal supply are closed and covered together with the fastening device 2. Consequently, in the event of a rear-end crash, the risk of injury owing to projecting fastening objects, contacts or cables is minimized.

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In accordance with figure 2, the monitor 1 is associated with the head restraint 4 optically and in terms of safety. The monitor 1 is mounted on the backrest 3.1 of the vehicle seat 3 and firmly connected to the backrest 3.1. In the event of a rear-end crash, a rear passenger impacts on the backrest 3.1.

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A collision of the rear passenger with the monitor 1 is thereby ruled out. In addition, the head restraint 4 stabilizes the monitor 1 with regard to vibrations produced by the driving dynamics of the engine and chassis. In order to maximize this stabilization, the monitor 1 bears with the entire rear housing side 1.2 against the rear side 4.2 of the head restraint 4.

The head restraint 4 can be adjusted for height in the direction of the x-axis independently of the position of the monitor 1. In this case, the monitor 1 can be swiveled about the y-axis in order to enable the rear passenger to set the viewing angle in relation to the display screen 1.5.

Owing to the firm arrangement of the monitor 1 on the backrest 3.1, the invention ensures that the rear passenger is not dazzled by oncoming vehicles when watching the monitor at night. This is achieved because no gap is formed between the head restraint 4 and the monitor 1.

The adapter 1.4 additionally has an operator panel 1.6 for the monitor 1.

List of reference numerals

- 1 Monitor
 - 1.1 Housing part
 - 5 1.2 Rear housing side
 - 1.3 Housing
 - 1.4 Adapter
 - 1.5 Display, display screen
 - 1.6 Operator panel
- 10 2 Fastening device
 - 3. Vehicle seat
 - 3.1 Backrest
 - 3.2 Frame part
 - 3.3 Bearing, bearing arrangement
 - 15 3.4 Bearing, bearing arrangement
- 4 Head restraint
 - 4.1 Holder
 - 4.2 Rear side